



GOAL 5: Waste Management

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GOAL 5: BETTER WASTE MANAGEMENT, RESTORATION OF CONTAMINATED WASTE SITES, AND EMERGENCY RESPONSE

America's wastes will be stored, treated, and disposed of in ways that prevent harm to people and to the natural environment. EPA will work to clean up previously polluted sites, restoring them to uses appropriate for surrounding communities, and respond to and prevent waste-related or industrial accidents.

OVERVIEW

Improper waste management and disposal threatens human health and the maintenance of healthy ecosystems. Uncontrolled hazardous and toxic substances, including radioactive waste, migrate to groundwater, surface water, and the air—ultimately affecting streams, lakes, rivers, and water supplies. To protect against these risks, EPA has developed and implemented policies to clean up active and inactive waste disposal sites; promote safe waste storage, treatment, and disposal; and prevent spills and releases of toxic materials. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) and the Resource Conservation and Recovery Act (RCRA) provide the legal authority for most of EPA's work toward this goal.

EPA and its partners use Superfund authority to clean up inactive and abandoned waste sites and, when possible, to encourage the redevelopment of these sites through the Agency's Brownfields program. Under RCRA, EPA works in partnership with States and Tribes to address risks associated with leaking underground storage tanks and with hazardous and non-hazardous waste generation and management at active facilities. Finally, EPA uses the authority of the Clean Air Act, Clean Water Act, and the Oil Pollution Act of 1990 to protect against spills and releases of hazardous materials.

EPA established two objectives to guide work toward the FY 2005 goal: ensure progress toward effective and efficient cleanups and ensure progress toward effective waste and hazardous material management, while providing capabilities to respond to all emergencies.

FY 1999 PERFORMANCE

Ensuring Progress Toward Effective and Efficient Cleanups

EPA's objective is that by 2005, the Agency and its partners will reduce or control the risk to human health and the environment at over 375,000 contaminated Superfund, RCRA, underground storage tanks (UST), and Brownfield sites.

Superfund

Cleaning up a Superfund site is often a multi-stage and multi-year process involving site assessment, materials removal, remedial activities, and enforcement actions. The Superfund cleanup process begins with site discovery or notification to EPA of possible releases of hazardous substances by various parties, including citizens, State agencies, and EPA Regional offices. Once discovered, sites proceed through the Superfund cleanup process as follows:

- Preliminary assessment/site inspection (emergency removal, if necessary).
- Listing of the site on the National Priorities List (NPL—the nation's most pressing hazardous waste sites).
- Remedial investigation/feasibility study to determine the nature and extent of contamination.
- Record of decision, documenting which cleanup alternatives will be used.
- Remedial design/remedial action, preparing plans and specifications to implement site remedies.

- Construction completion, or completion of remedial actions for site cleanup.
- Post-construction activities, including statutory five-year reviews, to maintain site safety.
- NPL site deletion, which removes the site from the NPL.

These steps help EPA to determine and implement the appropriate response to threats posed by releases of hazardous substances. Releases that require immediate or short-term response actions are addressed under the Emergency Response program of Superfund.

Site assessment is the first step in determining actions needed to mitigate risk or whether a site meets the criteria for placement on the NPL. In FY 1999, EPA made final Superfund site assessment decisions on 744 sites, for a cumulative total of 35,683 site assessments since 1982. In addition, a cumulative total of more than 200 sites have been removed from the NPL to help promote the economic redevelopment of these properties. Removal from the NPL follows a determination that no further Superfund action is necessary at a site.

In FY 1999, the Superfund response program made significant progress in cleaning up hazardous waste sites, including sites at Federal facilities, and protecting public health and the environment. The pace of completing construction has been greatly accelerated. Over three times the number of con-

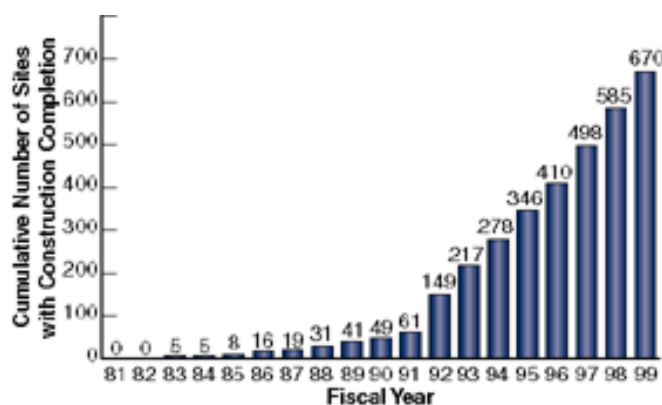
struction completions (521) have been achieved in the past seven years as compared to the first 12 years of the program, during which 149 construction completions occurred. The Agency has progressed from attaining 12 additional construction completions in 1991 to an annual average of over 74 per year from FY 1993 through FY 1999. More than 90 percent of the sites on the final NPL are either undergoing cleanup construction (remedial or removal) or are completed.

During FY 1999, 85 Superfund sites reached construction completion, meeting EPA's goal for a total of 670 over the life of the program (APG 28).

In FY 1999, 356 removal response actions were taken to immediately reduce the threat to public health and the environment, for a total of almost 6,000 over the life of the program. Since 1982, the Superfund program has cleaned over 216 million cubic yards of hazardous soil, solid waste, and sediment and over 325 billion gallons of hazardous liquid-based waste, contaminated groundwater, and contaminated surface water. In addition, the program has supplied over 431,000 people residing at or near NPL and other Superfund sites with alternative water supplies in order to protect them from contaminated groundwater and surface water.

Federal facility sites, which include formerly used defense sites, abandoned mines, nuclear weapons production plants, military ranges, fuel distribution areas, and landfills containing waste from Federal facilities, also are addressed under Superfund. EPA works with the local communities, the Department of Defense, the Department of Energy, and other Federal agencies to promote faster, more effective, and less costly cleanup of these sites. The Agency provides technical and regulatory oversight at Federal facility sites on the NPL to ensure protection of human health, effective implementation of the program, and meaningful involvement of the public. Reuse is encouraged where appropriate. Accomplishments at Federal facilities in FY 1999 included six construction completions, 64 sites with remedial action initiated, 43 removal actions initiated, 47 removal actions completed, and one deletion from the NPL. EPA also assisted in addressing radioactive contamination at 20 Federally owned Superfund sites in FY 1999.

Accelerating Superfund Cleanup Progress



In the past seven years (FY 1993-1999), the Superfund Program accomplished over three times the number of construction completions than occurred in the program's first 12 years combined.

RECYCLING SUPERFUND SITES: FROM WOODTREATING TO WAREHOUSING

In Brooklyn Center, Minnesota, Wickes Furniture Co. has put a toxin-tainted industrial parcel back in useful service by building a new distribution center on the Joslyn Manufacturing and Supply Company Superfund site. The site had been on the Federal Superfund and State priority lists for environmental cleanup and had remained vacant since 1981. "It was one of the most heavily polluted sites in the country," said Jeff Hall, President of Real Estate Recycling of Minneapolis, which developed the 203,000 square foot distribution facility for Wickes on the property. "It's been a terrific story of corporate responsibility," with Joslyn's owners and their insurers spending some \$17 million over the past 18 years to clean up the site, Hall said. The Wickes facility, which opened in August 1999, employs about 80 people and occupies half of the 30-acre site.

An important element of managing the Superfund program is EPA's effort to settle cases quickly and to ensure that Potentially Responsible Parties (PRPs) pay their fair share of clean-up costs. ***In FY 1999, PRPs financed more than 80 percent of long-term clean-up actions undertaken at non-Federal facilities, exceeding EPA's goal of 70 percent for the year (APG 29).***

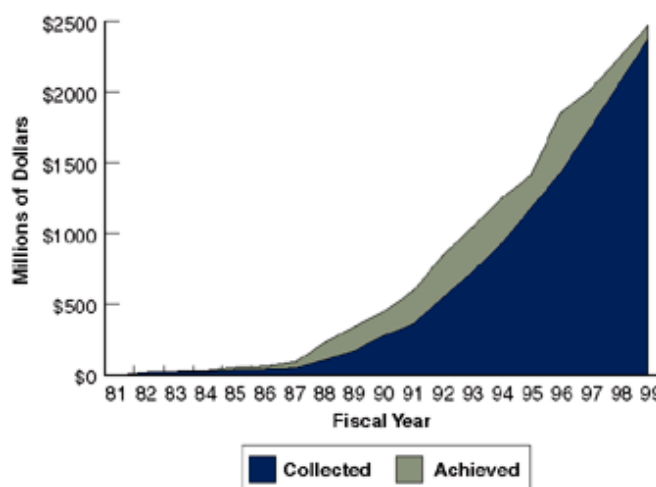
EPA recognizes that some PRPs may have contributed a very small amount of waste to a site. The Agency therefore is willing to enter into de minimis settlements with these PRPs and seek only limited contributions. In FY 1999, EPA entered into 38 of these settlements. As an incentive for PRPs to settle negotiations in the case of clean-up cost shares attributable to non-viable parties (i.e., companies or other parties who are insolvent or defunct), EPA also may make orphan share offers. Offers of orphan share compensation might include forgiveness of past costs or a waiver of future oversight costs at eligible sites. The Agency made 25 orphan share offers in FY 1999.

The Agency is also responsible for attempting to recover costs from PRPs in cases where EPA and others have already taken action to clean up sites. Recovering past costs not only ensures that polluters

pay for their activities but that resources will be available to clean up sites where PRPs either lack the funds for cleanup or cannot be located. EPA intends to address annually all those cases approaching statute of limitations (SOL) deadlines with past clean-up costs in excess of \$200,000. ***In FY 1999, EPA addressed all but one potential SOL case by negotiating settlements, referring cases to the Department of Justice for trial, or making a decision not to pursue cost recovery when no viable PRP could be located, meeting EPA's goal for the year (APG 30).***

In FY 1999, EPA's Superfund enforcement program obtained commitments from PRPs of over \$780 million to conduct future response work and to reimburse the Agency for its past costs. Of this amount, PRPs agreed to perform future response work valued at more than \$550 million or were ordered to or agreed to reimburse EPA \$230 million in past response costs. In addition, EPA collected and returned \$320 to the Superfund Trust Fund, which may include some of the \$230 million promised in settlements or by court-ordered judgements for past response costs. Since the beginning of the Superfund program in 1980, EPA has obtained commitments from PRPs or court-ordered judgements to reimburse the Agency for \$2,474 million in past costs; these costs are termed "achieved." Of that amount, \$2,378 million has been collected and returned to the Superfund Trust Fund. The annual progress of EPA's Superfund enforcement program since 1980 with respect to past costs "achieved" and collected is shown in the graph below.

Cumulative Superfund Costs Collected and Achieved



EPA engaged in several efforts to strengthen overall partnerships with States, Tribes, and other Superfund partners. For instance, 29 States, four Tribes, a number of contractors, and Federal agency representatives participated in the 1999 National Site Assessment Conference. EPA worked with the State of Illinois and EPA's Region 5 office to develop four State-led Records of Decision for action at Superfund sites. Region 5 also began an examination of methods to include Tribal cultural values more appropriately in the evaluation of site risks, and Region 6 initiated a study on potential quantitative methods for incorporating risks to Tribal cultural resources in the site priority-setting process. Additionally, EPA sponsored a national Tribal Risk Assessment conference to stimulate public dialogue on ways to consider Tribal cultural factors in risk decisions.

EPA also continued its efforts to work with potential real estate purchasers to address another problem area associated with Superfund sites. Often, the potential threat of CERCLA liability may pose a barrier to the beneficial reuse of some contaminated sites when potential new owners fear they will be held responsible for the inappropriate actions of others. To mitigate these concerns, EPA promotes redevelopment through Prospective Purchaser Agreements, which absolve prospective purchasers from cleaning up sites where they did not contribute to or worsen contamination. In FY 1999, EPA entered into 24 such agreements.

Resource Conservation and Recovery Act (RCRA)

The RCRA corrective action program focuses on more than 3,500 active industrial facilities across the country that treat, store, or generate hazardous waste. The most serious pollution problems at RCRA-regulated facilities occur when releases migrate off-site, contaminating public and private drinking water supplies or endangering wetlands and other sensitive ecosystems. EPA and its State partners have worked together on developing baselines and appropriate measures to track performance and to identify high-priority facilities requiring corrective action. The EPA program seeks to ensure that sites are maintained in a manner that poses no risk to human health or to the environment.

RCRA CLEAN-UP REFORMS

In FY 1999, EPA announced the RCRA Clean-up Reforms, focusing on reducing impediments to achieving the Agency's RCRA clean-up objective, enhancing partner and stakeholder involvement, and promoting innovative approaches to clean-up action. A centerpiece of the reforms is the recently promulgated Hazardous Waste Identification Rule (HWIR)-media regulation and the post-closure rule. The HWIR-media rule created a new RCRA permit for managing wastes from cleanup. The new permit will not require facility-wide corrective action that previously slowed clean-up progress at other sites.

In FY 1999, EPA's corrective action program documented that human exposure to toxins is under control at an additional 162 of the 1,712 high-priority facilities and that migration of contaminated groundwater is under control at an additional 188 facilities, exceeding the FY 1999 goal (APG 31). Over the life of the RCRA program, EPA and its State partners have documented that human exposures have been controlled at 477 facilities and that migration of contaminated groundwater has been controlled at 440 facilities.

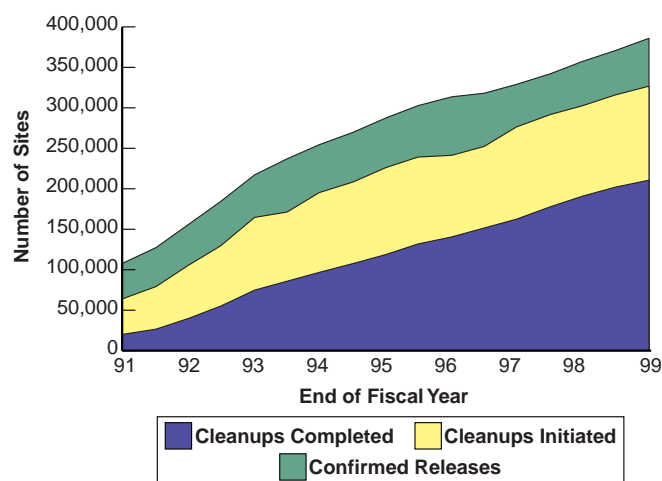
Leaking Underground Storage Tank Cleanups

Tasked with ensuring rapid and effective responses to underground petroleum storage tank releases, *EPA's Leaking Underground Storage Tank (LUST) Program worked with States, Tribes, and the regulated community to complete 25,678 cleanups in FY 1999, well in excess of the year's target of 22,000 cleanups (APG 32).*

At the beginning of FY 1999, a backlog of 168,000 LUST cleanups had yet to be completed. To address this backlog, as well as 26,434 additional confirmed releases, EPA worked with States, Tribes, and the regulated community on several initiatives, including implementing a risk-based decision-making approach to prioritizing corrective action at LUST sites. EPA also helped States develop Pay-for-Performance clean-up programs, in which contractors are paid based on actual contamination reduc-

National LUST Corrective Action Activity

(Cumulative Number of Corrective Actions FY 1991-FY 1999)



tions at sites. In FY 1999, EPA supported 14 out of 21 States that expressed an interest in starting Pay-for-Performance programs.

Brownfields

EPA promotes the assessment, cleanup, and sustainable reuse of abandoned or underutilized industrial and commercial properties, which contain or are perceived to contain environmental contamination. These properties, commonly known as Brownfields, exist in a significant number of communities throughout the nation. EPA's Brownfields program relies on local community involvement and strong stakeholder partnerships.

In FY 1999, EPA continued its commitment to Brownfields redevelopment by providing funding and technical support to 80 communities through its Brownfields Assessment Demonstration Pilot program, for a cumulative total of 307 communities. As a result of this progress, the Agency exceeded its FY 1999 goal of funding 300 projects by the end of 1999 (APG 33). The Brownfields Assessment Demonstration Pilots, each funded at up to \$200,000 over two years, will test redevelopment models, evaluate ways to remove regulatory barriers without sacrificing protectiveness, and facilitate coordinated site assessment, environmental cleanup, and redevelopment efforts at the Federal, State, and local levels.

Also in FY 1999, EPA awarded 45 Brownfields Cleanup Revolving Loan Fund (BCRLF) pilots. The pilots, each funded at up to \$500,000, will enable

eligible States, cities, towns, counties, and Tribes to capitalize on revolving loan funds to safely clean up and sustainably reuse Brownfields. This support enables communities that have completed their Brownfields Assessment Demonstration Pilot activities or have performed a targeted Brownfields assessment to make loans to prospective purchasers of Brownfields properties.

As a result of the Assessment Pilots and Revolving Loan Fund programs, EPA and its partners have completed 1,687 property assessments and 116 property cleanups and have initiated redevelopment activities at 151 Brownfields properties. These efforts have created over 4,416 clean-up and redevelopment jobs.

ATTRACTING BIG BUSINESS LEADS TO POSITIVE RESULTS FOR EMERYVILLE

Prosperity is gradually replacing blight in Emeryville, California. Two hundred units of mixed-income housing will be constructed on a four-acre Brownfield site, considerably lessening a housing shortage for the community. The city has attracted several developers to construct regional retail, hotel, and office developments that will create 2,500 jobs in the next five years. In addition, the second largest biotechnology firm in the country will construct 12 new company buildings over the span of 20 years, eventually creating over 3,000 high-paying jobs. With these successes, Emeryville is on its way to being a home to vibrant industry again.

Research Contributions

One obstacle to addressing waste sites effectively is that the demand for treatment often exceeds the capabilities of existing technologies. The Superfund Innovative Technology Evaluation (SITE) Program was created to meet the increased demand for alternative remediation and characterization technologies. SITE encourages the commercialization of innovative technologies by providing potential users with high-quality performance and cost data. *In FY 1999, work under the program proceeded according to schedule to meet its 2001 target, as EPA*

completed demonstrations of seven innovative technologies through partnerships with the private sector and other government agencies (APG 34).

IMPROVING TECHNOLOGY FOR SITE CLEANUP

Research has produced improved techniques for contaminated site characterization, risk assessment, and remediation that result in cheaper, faster cleanups and more effective risk reduction. An extensive field study on the application of permeable reactive barriers for solvents treatment in groundwater demonstrated faster, cheaper cleanups, while two field tests successfully removed a frequent and very problematic source of groundwater pollution: solvent contamination by dense non-aqueous phase liquids. These research projects also have contributed to technology transfer products for EPA, States, the private sector, and others.

Effective Risk Prevention Through Safe Waste Management

By 2005, EPA has committed that 282,000 facilities will be managed according to the practices that prevent releases to the environment, and EPA and its partners will have the capabilities to successfully respond to all known emergencies to reduce the risk to human health and the environment.

Resource Conservation and Recovery Act (RCRA)

The RCRA permitting program establishes a “cradle-to-grave” framework that identifies a set of controls that facilities should have in place to ensure the safe management of hazardous waste. *While complete data are not available to report on progress, the Agency and the States did make progress in FY 1999 toward the Agency’s goal of ensuring that 122 additional facilities have approved controls in place (APG 35).* Examples of approved controls include operating permits, verified clean closures, and post-closure permits. The Agency and its partners devoted a significant effort during the year to improving RCRA data reporting and collection. The Agency will address remaining problems in FY 2000 and will have data available for FYs 1999 and 2000 in the FY 2000 Annual Performance Report.

To control air emissions of certain pollutants covered under RCRA, the Agency promulgated the hazardous waste combustion Maximum Achievable Control Technology (MACT) rule in FY 1999. The regulation is designed to control emissions of dioxins, furans, and particulate matter at combustion facilities. EPA developed an innovative permitting approach that provides States with flexibility to implement the administrative portions of the rule in the way that best meets their needs.

Oil Storage Facilities and Oil Spill Prevention

To address the more than 20,000 oil spills that are reported to the Federal government each year, EPA’s Oil Spill Program works to ensure compliance with the Spill Prevention, Control, and Countermeasures (SPCC) requirements. *In FY 1999, 774 additional oil storage facilities became compliant with the SPCC requirements, meaning that EPA significantly exceeded its goal of bringing 190 facilities into compliance (APG 36).*

Underground Storage Tanks

The primary FY 1999 focus for the Underground Storage Tank (UST) Program was to help ensure that all UST owners and operators complied with EPA and State requirements for leak detection and the 1998 deadline for upgrading, replacing, or closure of substandard tanks. In complying with these rules, owners identified a total of 26,434 UST releases in FY 1999. By the end of FY 1999, EPA and State programs had ensured that over 646,000 USTs (approximately 85 percent of the universe) were in compliance with the 1998 requirements. Additionally, owners and operators permanently closed over 130,000 substandard USTs in FY 1999, bringing to almost 1.4 million the total number of substandard tanks closed.

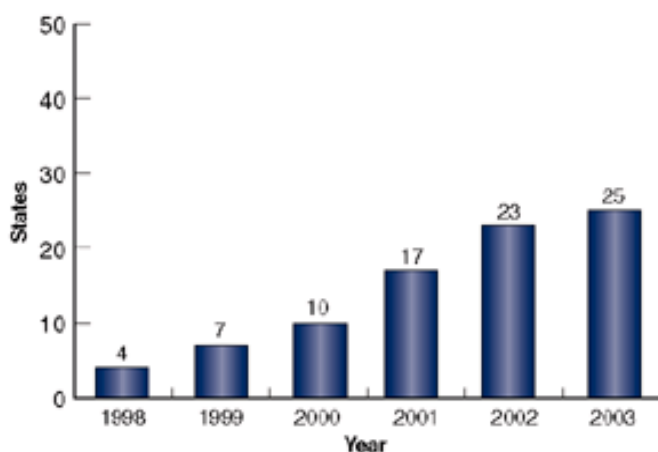
Another important component of EPA’s UST program is empowering States to run their own programs. By the end of FY 1999, EPA had approved UST programs in 27 States and in the District of Columbia and Puerto Rico.

National Preparedness

Industrial accidents and other disasters involving toxic chemicals and other hazardous substances are a constant threat to human health and the environ-

ment. In FY 1999, EPA implemented the Risk Management Plan (RMP) program, which requires industrial facilities to submit plans detailing contingencies and emergency response procedures, hazardous substance inventories, and disaster response scenarios. In FY 1999, facilities submitted 14,405 plans. By the end of FY 1999, EPA delegated authority to seven States for managing their own RMP programs. The graph shows the cumulative number of States that have implemented the RMP program through FY 1999 and those States expected to implement the program over the next four years.

States Implementing the RMP Program



Radiation Waste Management

EPA's Radiation Protection Division participates in developing environmental protection procedures for Federal facilities and also oversees their implementation. For example, EPA has an oversight role with regard to the Department of Energy's (DOE) waste disposal activities at the Waste Isolation Pilot Plant (WIPP) facility, the nation's first deep underground facility for radioactive waste disposal. WIPP opened and began accepting waste in FY 1999. By the end of the fiscal year, approximately 500 drums of radioactive waste were removed from the accessible environment and permanently disposed of at the plant. While not directly involved in handling the waste, EPA reviewed and evaluated DOE reports, conducted audits at the waste generator sites before allowing waste shipments, and completed inspections at the WIPP.

Research Contributions

Through the development of new and improved methods and models, the Agency's research provides the fundamental science and modeling needed to conduct state-of-the-art exposure modeling and risk assessment of hazardous materials and other environmental threats. *In FY 1999, EPA met its research commitment to complete a test version of a cumulative exposure model that integrates the environmental impact of multiple chemicals through multiple media and pathways (APG 37).* This research supports regulatory reform efforts under the Hazardous Waste Identification Rule (HWIR), which sets safe exit levels below which a waste or waste stream is excluded from regulation as a hazardous waste.

PROGRAM EVALUATION

EPA and other organizations have recently conducted various evaluations relevant to the Agency's waste management and clean-up programs. Summaries of two of these evaluations follow.

Superfund Innovative Technology Evaluation (SITE) Program

The most recent analysis of 71 Superfund Records of Decision (dated 1993 to 1997) showed that the Agency realized an estimated 70 percent average cost savings per site when the Superfund program employed innovative technologies tested in the SITE program rather than conventional remediation technologies. The program evaluation calculated a total cost savings of \$2.1 billion dollars associated with usage of the SITE technologies.

Oil Spill Program

In FY 1999, EPA conducted a national review of its Oil Spill Program to identify the program's most effective components and share the most promising innovations underway. The review highlighted an innovative enforcement approach, the Spill Prevention Control Counter Measure Expedited Enforcement Program, which was designed to identify and correct low-level spills within an expedited time frame of 30 to 60 days. The program review found that a demonstration pilot of this approach yielded a significant increase in both

enforcement and compliance. EPA is now considering this approach for national implementation efforts in FYs 2000 and 2001.

CONCLUSIONS AND CHALLENGES

EPA has made significant progress in meeting its FY 1999 performance goals for waste management programs. Agency research in support of safe waste management continues to develop cost-effective and innovative technologies and scientifically sound approaches for site cleanup. By working efficiently with States, Tribes, and other partners to make the most of Agency resources, EPA is confident about success in achieving its long-term goals.

Site Cleanup, Management, and Enforcement

Superfund will continue its emphasis on reducing risks to human health through completing construction at Superfund sites, including those at Federal facilities. This includes reliance on the “enforcement first” policy of ensuring cleanup by responsible parties through the successful implementation of recent administrative reforms. The participation of potentially responsible parties, especially for new construction starts at non-Federal NPL sites, will be encouraged, and cost recovery will continue to be emphasized.

Implementation of corrective action at RCRA hazardous waste management facilities will remain one of EPA’s highest priorities. The corrective action program will focus on controlling human exposure to toxins and groundwater releases at the 1,712 high priority facilities jointly identified by EPA Regions and State counterparts. EPA will work with States and Tribes to implement the RCRA Clean-up Reforms. Attention will be given to attaining the maximum use of program flexibility and practical approaches through comprehensive training, outreach, application of new enforcement tools, and enhancing community involvement through greater public access to information.

The LUST program will continue to support State efforts to make cleanups better, cheaper, and faster. EPA will promote risk-based decision-making (RBDM) in State and Tribal UST programs by developing ways to measure the performance of RBDM and by helping to resolve regional barriers to

RBDM development. In addition, the LUST program will continue to support corrective action information exchanges, assist state enforcement efforts to promote cleanups, develop policy guidance and technical manuals, and sponsor workshops and training events. Of special concern to the program are emerging issues surrounding methyl tertiary butyl ether and other fuel oxygenates, such as the potential need to reassess previously cleaned sites for additional testing and remediation.

Economic Revitalization of Waste Sites

EPA is committed to integrating the concept of economic revitalization into the process of cleaning up contaminated waste sites and other properties. Several initiatives have made significant progress in this arena in a relatively short amount of time. The Brownfields program continues to work with States and local communities to assess, clean up, and reuse former industrial and commercial properties where expansion or redevelopment is complicated by potential environmental contamination, liability, or other concerns. The RCRA corrective action and UST programs will continue to identify instances where redevelopment is complicated by regulatory or programmatic barriers. These programs will work with stakeholders to overcome these barriers through the development of streamlined and innovative approaches to permitting and remediation. Implementation of the Superfund redevelopment initiative will continue by early identification of sites that can be returned to productive reuse once cleanup is completed, issuance of prospective purchaser agreements to allay liability concerns, and work with communities to ensure that these sites are “recycled” back into productive use.

Improving Environmental Data

A significant challenge is the need to develop effective measures to track the relationship between the Agency’s activities and resulting environmental improvements. For waste prevention programs such as RCRA, the challenge is especially difficult because the risk avoided from facility releases prevented as a result of implementing approved RCRA controls cannot be quantified. Remaining data gaps within cumulative exposure modeling and risk assessment also add to the challenge of developing meaningful

performance measures. EPA continues to stress partnerships and practical approaches in making the most of Agency resources to gather this information and work toward other aspects of the Agency's objectives for safe waste management, restoration of contaminated waste sites, and emergency response preparedness.

KEY MILESTONES FOR THE FUTURE

- In FY 2000, EPA will achieve cleanup of over 245,000 cumulative underground storage tank releases.
- In FY 2001, EPA will promulgate the RCRA Standardized Permit Rule and HWIR-Waste Rule.
- In FY 2002, EPA will achieve clean-up construction at a total of 900 Superfund sites and meet the deadline for regulated community compliance with the hazardous waste combustion Maximum Achievable Control Technology (MACT) rule, which was promulgated in 1999.
- In FY 2003, EPA will attain controls to prevent human exposures and groundwater releases at over 50 percent of RCRA corrective action sites.

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